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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,321	09/23/2003	Atsufumi Omori	243091US2	9267
22850	7590	09/21/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			PHAM, HAI CHI	
		ART UNIT		PAPER NUMBER
				2861

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/667,321	OMORI ET AL.
	Examiner Hai C Pham	Art Unit 2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) Claim(s) ____ is/are allowed.
- 6) Claim(s) 1,2,4,6,15,16,18,20,29-35,38-42,45 and 46 is/are rejected.
- 7) Claim(s) 3,5,7-14,17,19,21-28,36,37,43 and 44 is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 02/17/04, 02/18/04.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: ____.

DETAILED ACTION***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.
3. The following claims are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1:

- The following limitation “a detector detecting a time interval” appears to be unclear in that it is not known how it “detects a time interval”. Suggest rephrasing the claimed limitation as follows “a detecting circuit detecting a time interval”.

Claim 15:

- The following limitation “a detector detecting a time interval” appears to be unclear in that it is not known how it is differentiated from the horizontal synchronization detector and how it “detects a time interval”. There is not shown a supplemental detector for specifically detecting the time interval.

Suggest rephrasing the claimed limitation as follows “a detecting circuit detecting a time interval”.

Claim 31:

- The following limitation “a detector detecting a time interval” appears to be unclear in that it is not known how it is differentiated from the horizontal synchronization detector and how it “detects a time interval”. Suggest rephrasing the claimed limitation as follows “a detecting circuit detecting a time interval”.

Claim 32:

- “a plurality of the light beams” is unclear since there is only one light beam source being claimed. It should be rephrased as follows “the light beam”.

Claim 33:

- “a plurality of the light beams” is unclear since there is only one light beam source being claimed. It should be rephrased as follows “the light beam”.

Claim 34:

- “a plurality of the light beams” is unclear since there is only one light beam source being claimed. It should be rephrased as follows “the light beam”.

Claim 35:

- “a plurality of the light beams” is unclear since there is only one light beam source being claimed. It should be rephrased as follows “the light beam”.

Claim 38:

- The following limitation “a detector detecting a time interval” appears to be unclear in that it is not known how it is differentiated from the horizontal synchronization detector and how it “detects a time interval”. Suggest rephrasing the claimed limitation as follows “a detecting circuit detecting a time interval”.

synchronization detector and how it “detects a time interval”. Suggest rephrasing the claimed limitation as follows “a detecting circuit detecting a time interval”.

Claim 39:

- “a plurality of the light beams” is unclear since there is only one light beam source being claimed. It should be rephrased as follows “the light beam”.

Claim 40:

- “a plurality of the light beams” is unclear since there is only one light beam source being claimed. It should be rephrased as follows “the light beam”.

Claim 41:

- “a plurality of the light beams” is unclear since there is only one light beam source being claimed. It should be rephrased as follows “the light beam”.

Claim 42:

- “a plurality of the light beams” is unclear since there is only one light beam source being claimed. It should be rephrased as follows “the light beam”.

Claim 45:

- The following limitation “a detector detecting a time interval” appears to be unclear in that it is not known how it is differentiated from the horizontal synchronization detector and how it “detects a time interval”. Suggest rephrasing the claimed limitation as follows “a detecting circuit detecting a time interval”.

Claim 46:

- The following limitation “a detector detecting a time interval” appears to be unclear in that it is not known how it is differentiated from the horizontal synchronization detector and how it “detects a time interval”. Suggest rephrasing the claimed limitation as follows “a detecting circuit detecting a time interval”.

Claims 2-14, 16-28, 36-37, 43-44 are dependent from claims 1, 15, 31 and 42 above and are therefore indefinite.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 4, 6, 30-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Isono et al. (U.S. 4,872,065).

Isono et al. discloses an image recording apparatus having a pixel clock generation apparatus comprising a detecting circuit (using counter 31) detecting a time interval (as a count value) between two horizontal synchronization signals (outputted by respective start sensor 12 and end sensor 14) (Fig. 6), a comparing part comparing the time interval detected by said detector and a target value (prescribed count value), and outputting a difference therebetween (col. 2, lines

46-61), a phase shift data generation part having a lookup table (translation table 28) storing a pattern of phase shift data for controlling a phase shift amount of a pixel clock (the stored data representing crossover timing and crossover phase direction) (col. 8, lines 34-40), and reading and outputting the phase shift data from the lookup table based on the difference that is output from said comparing part, a high frequency clock generation part generating a high frequency clock (clock generator 15 generating a clock signal of a frequency N times the frequency of the dot recording clock signal) (col. 10, lines 53-61), and a pixel clock generation part generating the pixel clock whose phase is controlled in accordance with the phase shift data that are output from said phase shift data generating part based on the high frequency clock that is generated by said high frequency clock generating part.

Isono et al. further teaches :

- (referring to claim 2) phase control of the pixel clock is performed on each data area, where one data area is formed by a plurality of consecutive pixel clocks (Fig. 7),
- (referring to claim 4) the pixel clocks subjected to phase shift are spaced substantially equally (Fig. 7),
- (referring to claim 6) the pixel clocks subjected to phase shift are spaced unequally (col. 11, line 64 to col. 12, line 12),
- (referring to claim 31) a medium (3) to be scanned, a deflecting part (polygon mirror 8) deflecting the light beam output from said light beam source so that the deflected light beam scans (using scanning lens 9) said

medium to be scanned and forms an image on said medium to be scanned (Fig. 5),

- (referring to claim 32) the horizontal synchronization detector consists of a unit separating the light beam deflected by the deflecting part, and two or more photodetectors (start sensor 12 and end sensor 14) receiving the light beams separated by said unit (using mirrors 11 and 13) and arranged at respective positions corresponding to the two or more specific horizontal scan positions (Fig. 5),
- (referring to claim 33) the horizontal synchronization detector consists of a unit separating a part the light beam deflected by the deflecting part, two or more reflecting members (mirrors 11 and 13) arranged at respective positions corresponding to the specific horizontal scan positions, the light beams separated by said unit being incident on said reflecting members, and a photodetector receiving the light beam reflected by the reflecting members (Fig. 5).

The method claim 29 is deemed to be clearly anticipated by functions of the above structures.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 15-16, 18, 20, 29, 38-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al. in view of Hoshino et al. (U.S. 5,283,681).

Isono et al. discloses all the basic limitations of the claimed invention except for the provision of three or more horizontal synchronization signals.

Hoshino et al. discloses a scanning optical apparatus provided with means for detecting scanning beam spots at more than two points of the scanned surface (Fig. 11).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the device of Isono et al. with more than two detectors along the scanned surface as taught by Hoshino et al. The motivation for doing so would have been to allow precise measurement of the time interval at desired positions of the beam spots on the scanned surface.

8. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al. in view of Yoshida (U.S. 6,476,955).

Isono et al. discloses all the basic limitations of the claimed invention except for the reflecting/transmitting members.

Yoshida discloses a scanning optical system having a start-of-scan sensor (10) for detecting a position of the light beam deflected by the polygon mirror (5) and separated by deflection on the bending mirror (12) and focused by the detector lens (11).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the transmitting member or detector lens in the device of Isono et al. as taught by Yoshida. The motivation for doing so would have been to the beam to be precisely focused on the receiving surface of the beam detector.

9. Claims 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al. in view of Hoshino et al., as applied to claim 38 above, and further in view of Yoshida.

Isono et al., as modified by Hoshino et al., discloses all the basic limitations of the claimed invention except for the reflecting/transmitting members.

Yoshida discloses a scanning optical system having a start-of-scan sensor (10) for detecting a position of the light beam deflected by the polygon mirror (5) and separated by deflection on the bending mirror (12) and focused by the detector lens (11).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the transmitting member or detector lens in the device of Isono et al. as taught by Yoshida. The motivation for doing so would have been to the beam to be precisely focused on the receiving surface of the beam detector.

10. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno (U.S. 6,366,336) in view of Isono et al.

Kanno discloses a tandem image forming apparatus comprising a pixel clock generator (103) for generating a pixel clock based on the measurement of a scan time by the counter (102) as detected by the start-point detector and the end-point detector (Fig. 2).

However, Kanno fails to teach the phase shift correction of the pixel clock.

Isono et al. discloses a pixel generation clock and a phase shift correction based on the data stored on the translation table (see rejection in paragraph 5 above).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the phase shifting correction of the pixel clock in the device of Kanno as taught by Isono et al. The motivation for doing so would have been precisely control the length of the scanning lines and the registration of the color image.

11. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno in view of Isono et al. and Hoshino et al.

Kanno discloses a tandem image forming apparatus comprising a pixel clock generator (103) for generating a pixel clock based on the measurement of a scan time by the counter (102) as detected by the start-point detector and the end-point detector (Fig. 2).

However, Kanno fails to teach the phase shift correction of the pixel clock and the plural detectors.

Isono et al. discloses a pixel generation clock and a phase shift correction based on the data stored on the translation table (see rejection in paragraph 5 above). Hoshino et al. discloses a scanning optical apparatus provided with means for detecting scanning beam spots at more than two points of the scanned surface (Fig. 11).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the phase shifting correction of the pixel clock in the device of Kanno as taught by Isono et al. The motivation for doing so would have been precisely control the length of the scanning lines and the registration of the color image.

Allowable Subject Matter

12. Claims 3, 5, 7-14, 17, 19, 21-28, 36-37 and 43-44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of claims 3 and 17 is the inclusion therein, in combination as currently claimed, of the limitation "wherein the phase shift data generating part stores a plurality of the lookup tables, and the lookup tables from which the phase shift data are read are

switched within one scan line period”, which is not found taught the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claims 5 and 19, is the inclusion therein, in combination as currently claimed, of the limitation “wherein the phase shift data generation part includes a unit that sets an interval between the pixel clocks subjected to the phase shift to a value obtained by multiplying a reference value by a multiplying factor for correction corresponding to a resolution”, which is not found taught the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claims 7 and 21, is the inclusion therein, in combination as currently claimed, of the limitation “wherein, in an image height region having a great variation of a main scan dot position shift, an interval between the pixel clocks subjected to phase shift is decreased compared to in an image height region having a small variation of the main scan dot position shift”, which is not found taught the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claims 8 and 22, is the inclusion therein, in combination as currently claimed, of the limitation “wherein the phase shift data generation part switches, for each scan line, a plurality of the lookup tables from which the phase shift data are read”, which is not found taught the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claims 9 and 23, is the inclusion therein, in combination as currently claimed, of the limitation

"wherein, when there are consecutive scan lines to which the phase shift data of an identical pattern are output, the phase shift data generation part varies the pattern of the phase shift data", which is not found taught the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claims 10 and 24, is the inclusion therein, in combination as currently claimed, of the limitation "wherein, when there are consecutive scan lines to which the phase shift data of an identical pattern are output, the phase shift data generation part varies the pattern of the phase shift data by switching a plurality of the lookup tables", which is not found taught the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claims 36, 37, 43, 44, is the inclusion therein, in combination as currently claimed, of the limitation "the light beam source for reference", which is not found taught the prior art of record considered alone or in combination.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D Meier can be reached on (571) 272-2149.

Art Unit: 2861

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM
PRIMARY EXAMINER
September 18, 2004